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# First record of *Lagocephalus sceleratus* in the Adriatic Sea (Croatian coast), a Lessepsian migrant

by

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**Résumé.** – Premier signalement de *Lagocephalus sceleratus* en mer Adriatique (côte croate), un poisson migrateur lessepsien.

Le premier signalement en mer Adriatique du poisson migrateur lessepsien *Lagocephalus sceleratus* (Gmelin, 1789) a été enregistré le 17 octobre 2012. Une femelle sexuellement mature (Lt = 66.3 cm) et pesant 3,531 kg a été capturée sur la côte nord de l'île de Jakljan (Adriatique sud).

**Key words.** – Tetraodontidae – *Lagocephalus sceleratus* – Adriatic Sea – Lessepsian migrant – First record.

The silver-stripe blaasop *Lagocephalus sceleratus* (Gmelin, 1789) is distributed in the tropical Indian and Pacific Oceans, from where it originates (Smith and Heemstra, 1986). In the Mediterranean Sea, it was first noted in 2003 on the south-eastern Aegean Sea coast of Turkey (Feliz and Er, 2004; Akyol *et al.*, 2005). Thereafter, sightings were noted in the southeastern, eastern and northeastern parts of the Mediterranean (Milazzo *et al.*, 2012; Kalogirou, 2013). This paper presents the first documented record of the silver-stripe blaasop in the Adriatic Sea.

A single specimen of *L. sceleratus* was caught with a beach seine by local fishermen on October 17, 2012 on the northern side of Jakljan Island (Southern Adriatic 42°45'N, 17°48'E) (Fig. 1).

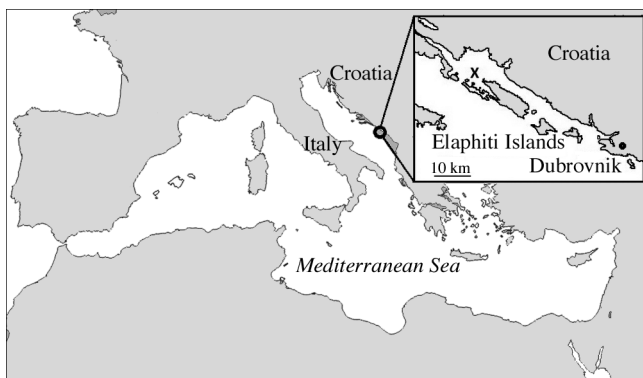


Figure 1. – Region of capture on the northern side of Jakljan Island, Southern Adriatic (X).

Table I. - Measurements and counts for the *Lagocephalus sceleratus* specimen caught on the north side of Jakljan Island (Adriatic Sea, Croatia), October 2012.

Measurements	cm
Total length (TL)	66.3
Standard length (SL)	58.6
Predorsal length (PdL)	38.7
Preanal length (PaL)	38.0
Prepectoral length (PpL)	16.0
Maximum body height (H)	10.1
Minimum body height (h)	2.2
Head length (HL)	12.8
Eye diameter (ED)	3.3
Interocular distance (IO)	7.6
Preocular distance (PO)	9.4
Counts	(n)
Dorsal fin rays (D)	12
Anal fin rays (A)	10
Pectoral fin rays (P)	18
Caudal fin rays (C)	25

Eleven morphometric and four meristic measurements are presented in table I. After processing, the specimen was conserved in the Ichthyological collection of the Dubrovnik Natural History Museum under the inventory number PMD 1264.

The noted specimen (Fig. 2) is a female with a total length (TL) of 66.3 cm and a mass of 3.531 g. The gonad mass weighed 53 g. The specimen body is elongated and slightly compressed laterally and ventrally. The dorsal and anal fins have a short base and are positioned opposite from each other. The pectoral fins are broad, while the tail fins are lunate. Ventral fins were absent. Small spinules are present in the dorsal and ventral area. On the dorsal side, spinules were extended from the upper lip to the dorsal fin, while ventrally they do not reach the anus. The colour on the dorsal side is greyish-greenish with black spots. From mouth to caudal fin on the lateral side, two silver bands were present. The ventral side of the body is white. A silver blotch is present in front of the eyes. Meristic counts, morphometric measurements and colour of the

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Figure 2. - The *Lagocephalus scleratus* (Gmelin, 1789) specimen (66.3 cm TL) captured on October 17, 2012 on the northern side of Jakljan Island.

examined material are well in accordance with previous descriptions by Akyol *et al.* (2005).

The body of this Lessepsian migrant contains the strongest paralytic toxin known today, tetrodotoxin, which is most frequently present in the liver, gonads, digestive tract and in the skin (Field, 1998; Katikou *et al.*, 2009; Sabrah *et al.*, 2009). Tetrodotoxin is found in the skin of other species of the family Tetraodontidae, of which two have been recorded in the Adriatic Sea over the last twenty years: *Sphoeroides pachygaster* (Müller & Troschel, 1848) firstly captured in 1992 in central Adriatic (Jardas and Pallaoro, 1996), and *Lagocephalus lagocephalus* (Linnaeus, 1758) in 2004 in Molunat Bay (eastern coast of the southern part of the Adriatic) (Dulčić and Pallaoro, 2006). Since the first record of *S. pachygaster* up until today, a number of specimens from this species have been recorded (Jardas and Pallaoro, 1996), while there was no later record of *L. lagocephalus* (Dulčić and Dragičević, 2011).

Only 13 species (without present record) that entered the Mediterranean Sea through the Suez Canal have reached the Adriatic Sea (Dulčić and Dragičević, 2011). They have not significantly affected the Adriatic ichthyofauna till now due to the fact that most of the findings recorded only one specimen (Dulčić and Dragičević, 2011). Some of them have been recorded in various life stages, such as the dusky spinefoot *Siganus luridus* (Rüppell, 1829) and the blue-spotted cornetfish *Fistularia commersonii* Rüppell, 1838 (Dulčić *et al.*, 2011, 2012), which indicates rapid adaptation and higher abundances.

*L. scleratus* has been reported to have the ability to quickly spread in various habitats of the eastern Mediterranean Sea (Bilecenoglu *et al.*, 2006; Kalogirou *et al.*, 2012; Nader *et al.*, 2012; Kalogirou, 2013), becoming dominant in established habitats (Kalogirou *et al.*, 2010) and exploit resources (Kalogirou, 2013). Therefore, the rapid expansion of this species can affect diversity, as well as the abundance of native species in the near future, especially with changing environmental conditions through climate change, since this is expected to smooth the progress of its adaptation to new environments (Kalogirou, 2013). Reproduction of *L. scleratus* have been studied by Aydın (2011) and Kalogirou (2013) showing that maturity is reached at 36 cm for combined sexes and reproductive period peaks during May-July. It is important to warn the public of its toxicity, and fishermen in particular, regarding the importance of reporting each captured fish.

## REFERENCES

- AKYOLO O., ÜNAL V., CEYHAN T. & BILECENOGLU M., 2005. - First confirmed record of *Lagocephalus scleratus* (Gmelin, 1789) in the Mediterranean Sea. *J. Fish Biol.*, 66: 1183-1186.
- AYDIN M., 2011. - Growth, reproduction and diet of pufferfish (*Lagocephalus scleratus* Gmelin, 1789) from Turkey's Mediterranean sea coast. *Turk. J. Fish. Aquat. Sci.*, 11: 589-596.
- BILECENOGLU M., KAYA M. & AKALIN S., 2006. - Range expansion of silverstripe blaasop, *Lagocephalus scleratus* (Gmelin, 1789), to the northern Aegean Sea. *Aquat. Inv.*, 1: 289-291.
- DULČIĆ J. & PALLAORO A., 2006. - First record of the oceanic puffer (*Lagocephalus lagocephalus* Linnaeus, 1758) for the Adriatic Sea. *J. Appl. Ichthyol.*, 22: 94-95.
- DULČIĆ J. & DRAGIČEVIĆ B., 2011. - Nove ribe Jadranskog i Sredozemnog mora [New fishes of the Adriatic and Mediterranean Sea]. 160 p. Split: Institute of Oceanography and Fisheries; State Institute for Nature Protection. [in Croatian]
- DULČIĆ J., DRAGIČEVIĆ B., GRGIČEVIĆ R. & LIPEJ L., 2011. - First substantiated record of a Lessepsian migrant – the dusky spinefoot, *Siganus luridus* (Actinopterygii: Perciformes: Siganidae), in the Adriatic Sea. *Acta Ichthyol. Piscat.*, 41: 141-143.
- DULČIĆ J., ANTOLOVIĆ N., KOŽUL V., DRAGIČEVIĆ B. & LIPEJ L., 2012. - First records of juveniles of two Lessepsian migrants, *Fistularia commersonii* Rüppell, 1838 and *Siganus luridus* (Rüppell, 1829), in the Adriatic Sea. *J. Appl. Ichthyol.*, 29: 661-662.
- FELIZ H. & ER M., 2004. - New guests in the Mediterranean Sea. *Deniz Magazin Dergisi*, 52-54. [In Turkish]
- FIELD J., 1998. - Puffer fish poisoning. *J. Accid. Emerg. Med.*, 15: 334-336.
- JARDAS I. & PALLAORO A., 1996. - The records of *Sphoeroides cutaneus* (Gunther, 1870) (Pisces, Tetraodontidae) in the Adriatic Sea. *Oebalia*, 12: 83-90.
- KALOGIROU S., 2013. - Ecological characteristics of the invasive pufferfish *Lagocephalus scleratus* (Gmelin, 1789) in the eastern Mediterranean Sea – a case study from Rhodes. *Medit. Mar. Sci.*, 14: 251-260.
- KALOGIROU S., CORSINI-FOKA M., SIOULAS A., WENNHAGE H. & PIHL L., 2010. - Diversity, structure and function of fish assemblages associated with *Posidonia oceanica* beds in an area of the eastern Mediterranean Sea and the role of non-indigenous species. *J. Fish Biol.*, 77: 2338-2357.
- KALOGIROU S., WENNHAGE H. & PIHL L., 2012. - Non-indigenous species in Mediterranean fish assemblages: Contrasting feeding guilds of *Posidonia oceanica* meadows and sandy habitats. *Estuar. Coast. Shelf S.*, 96: 209-218.
- KATIKOU P., GEORGANTELIS D., SINOURIS N., PETSI A. & FOTARAS T., 2009. - First report on toxicity assessment of the Lessepsian migrant pufferfish *Lagocephalus scleratus* (Gmelin, 1789) from European waters (Aegean Sea, Greece). *Toxicol.*, 54: 50-55.
- MILAZZO M., AZZURRO E. & BADALAMENTI F., 2012. - On the occurrence of the silverstripe blaasop *Lagocephalus scleratus* (Gmelin, 1789) along the Libyan coast. *Biol. Inv.*, 1: 125-127.
- NADER M.R., INDARY S. & BOUSTANY L., 2012. - The puffer fish *Lagocephalus scleratus* (Gmelin, 1789) in the eastern Mediterranean. GCP/INT/041/EC - GRE - ITA/TD-10.
- SABRAH M.M., EL-GANAINY A.A. & ZAKY M.A., 2006. - Biology and toxicity of the pufferfish *Lagocephalus scleratus* (Gmelin, 1789) from the gulf of Suez Egyptian. *J. Aquat. Res.*, 32: 283-297.
- SMITH M.M. & HEEMSTRA P.C., 1986. - Tetraodontidae. In: Smiths' Sea Fishes (Smith M.M. & Heemstra P.C., eds), pp. 894-903 Berlin: Springer Verlag.